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| EXAMINER | |
|---|---|
| SKIBINSKY, ANNA | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1631 | |

| NOTIFICATION DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/616,869 | GULATI, SANDEEP | |
| | Examiner | Art Unit | |
| | ANNA SKIBINSKY | 1631 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10,12,13 and 16-65* is/are pending in the application.

4a) Of the above claim(s) *19-63* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12,13,16-18,64 and 65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

Applicants' arguments, filed 10/14/2008 have been fully considered but they are not deemed persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Amendments to claim 1 are acknowledged. Claims 1-10, 12, 13, 16-18 and 64-65 are under examination.

Claims 19-63 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group and species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/5/07.

Claims 11, 14 and 15 are cancelled.

### *Claim Rejections - 35 USC § 101*

1. The instant rejection is maintained from the previous Office Action filed 6/11/2008.

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-10, 12, 13, 16-18 and 64-65 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-10, 12, 13, 16-18 and 64-65 are drawn to a computer system comprising a processor for performing interferometric analysis to detect the presence of

an event. The processor according the claimed system carries out the application of algorithms and computations of performing active interferometeric analysis and processes an event and, therefore, involves the application of a judicial exception. Regarding inventions involving the application of a judicial exception, said application must be a practical application of the judicial exception that includes either a step of a physical transformation, or produces a useful, concrete, and tangible result (State Street Bank & Trust Co. v. Signature Financial Group Inc. CAFC 47 USPQ2d 1596 (1998), AT&T Corp. v. Excel Communications Inc. (CAFC 50 USPQ2d 1447 (1999)). In the instant claims, there is no step of physical transformation, thus the instant claims must recite a practical application; i.e. recite a useful, concrete, and tangible result. See MPEP 2106, in particular, Section IV, for an explanation of a concrete, tangible and useful result.

Claims 1-10, 12, 13, 16-18 and 64-65 do not recite a tangible result. A tangible result requires that the claim must set forth a practical application to produce a real-world result. Examples of a "real-world result" include a physical transformation of matter, or a step of communicating the result in a TANGIBLE format to a user; e.g. by outputting or displaying the result of the method. Applicant is reminded that any amendment must be fully supported and enabled by the originally filed description.

As the claims do not recite a physical transformation of matter OR a concrete, tangible and useful result, they are not directed to statutory subject matter.

***Response to Arguments***

1. Applicant's arguments filed 10/14/2008 have been fully considered but they are not persuasive.

2. Applicants argue (Remarks, pages 20-21) that the instant claims now recite providing the obtained event of interest as output.

3. In response, the rejection of record is maintained because the processor is solely directed to carrying out a process which is non-statutory. The processor now performs the operation of providing the event of interest as output however, it is not specifically recited what that output is, for example if it is in user readable form and to a display. Merely providing an output does not render the operations of the processor statutory because the output may be to another computer in which case it is not a tangible real world result.

4. As the instant claims fail to recite either a physical transformation of matter or a real-world (i.e. concrete, tangible, and useful) result of the method for the reasons set forth above, the examiner maintains that they encompass nonstatutory subject matter.

5. Therefore the processor which carries out this non-statutory process is therefore also non-statutory.

## *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-10, 12, 13, 16-18 and 64-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfeifer et al. (CIRP Annals-Manufacturing Technology, vol. 51 (2002) pages 455-458) in view of Vol'pov et al. (Soviet Journal of Quantum Electronics, vol. 20 (1990), pages 1517-1522).

4. Pfeifer et al. teach a virtual interferometer that simulates interferometric measurements in a virtual environment to reproduce a physical interferometrical measurements in a computer (i.e. computationally induced interference; processor) (page 455, col. 1, ¶5), as in claim 1. Pfeifer et al. teach obtaining the effect of temperature variations (page 456, col. 2, section "Results") (i.e. obtaining the event of interest). Pfeifer et al. also teach using the virtual interferometer to investigate different error sources (page 457, col. 2, section "Conclusions") (i.e. event of interest is processes in a different way than other events), as in claim 1.

5. Pfeifer et al. teach using the virtual interferometer in conjunction with ANSYS software (page 456, col. 2, ¶4), as in claim 2.

6. Pfeifer et al. teach using date representing temperature, wavelengths, and simulations (page 456-457, section "Results") (i.e. static or dynamic data), as in claim 3.

7. Pfeifer et al. teach inspection of wafers for the semiconductor industry or inspection of optical components (page 455, col. 1, ¶2) (i.e. glass-based arrays, thin film arrays), as in claim 7.

8. Pfeifer et al. teach separating error sources using the virtual interferometer (page 455, col. 1, ¶4-5), as in claim 8.

9. Pfeifer et al. teach a platform for a specimen (Figure 1) with a mesh surface (i.e. array) wherein a list of knots are exported to exclude discontinuous surface values unsuitable for ray-tracing (i.e. extract spectral invariants)(page 456, col. 2, ¶2), as in claim 9.

10. Pfeifer et al. teach software to emulate wave-wave interactions (page 457, col. 1, ¶3), as in claim 16.

11. Pfeifer et al. do not teach "receiving an input signal including events of interest and active interferometric analysis using an expressor function to detect the presence of an event of interest within an arrayed signal pattern".

12. Vol'pov et al. however teach an active interferometric method using an algorithm (i.e. active interferometric analysis). Receiving of the reflected signals from small distant objects of interest (i.e. events of interest) and the use of expressor functions that are quantized with values of wavelength (i.e. quantum expressor function), as in claim 4, to express the light are taught (page 1518, col. 1, section "Recording the Reflected Signal"), as in claim 1.

13. Vol'pov et al. further teach that application of the method can be applied to one or two dimensional arrays (page 1521, col. 1, line 20) of phases (i.e. arrayed signal pattern), as in claims 1 and 5.

14. Vol'pov et al. also teach obtaining the result (page 1521, section "Practical Realization", Figure 1) (i.e. obtaining the event of interest from the input signal), as in claim 1.

15. Vol'pov et al. teach light emerging from apertures of finite dimensions (page 1518, col. 1, ¶2) (i.e. optical platforms), as in claim 6.

16. Vol'pov et al. teach expressor functions to synthesis of a Fourier spectrum representing events of interest (Abastract; and page 1518, col. 2, ¶3-4), as in claim 9, and time modulation (i.e. time domain sequences), as in claims 10 and 17.

17. Vol'pov et al. teaches active interferometric analysis which includes detection and quantitation analysis (page 1518, section "Recording of the Reflected Signal") wherein detection of small objects and quantitation of the photodetector signal (page 1528, col. 2, ¶1), as in claim 12.

18. Vol'pov et al. teach the construction of images using spectra (i.e. constructive interferometric analysis)(page 1522, col. 1, ¶2), as in claim 13.

19. Vol'pov et al. teach integrating the energy to determine the signal recorded by the photo detector, wherein energy (iterative convergence) is expressed with values of wave length (i.e. resonance events) (page 1518, col. 2, ¶1), as in claim 18.

20. Vol'pov et al. teach light beams emerging through spatially separated apertures wherein the atmosphere induces phase distortions (page 1518, col. 2, ¶2) (i.e. destructive interference), as in claim 64.

21. Vol'pov et al. the analysis of the reflection of light off of small objects in an atmosphere (i.e. wave-particle interactions)(Abstract), as in claim 65.

22. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the virtual interferometer and software as taught by Pfeifer et al. to analyze the detected signals with the active interferometric process as taught by Vol'pov et

al. One of skill in the art would have been motivated to construct images of small objects in a turbulent atmosphere as taught by Vol'pov et al. with the virtual interferometer as taught by Pfeifer et al. because Vol'pov et al. teach the need for higher sensitivity of the energy and higher quality of images (page 1517, col. 1, ¶1-2) which can be satisfied by the satisfied by the virtual calculations with a virtual interferometer as taught by Pfeifer. One of kill in the art would have a reasonable expectation of success in using the virtual interferometer as taught by Pfeifer et al. to calculate active interferometric analysis because Vol'pov et al. teaches the use of algorithms (page 1517, col. 2, ¶2) that can be adapted to a computer and software as taught by Pfeifer et al.

***Response to Arguments***

Applicant's arguments filed 10/14/2008 have been fully considered but they are not persuasive.

Applicant's argue (Remarks, page 22, ¶4) that Pfeiffer does not teach receiving any kind of input signal. Applicant's further argue that Vol'pov does not describe receiving the claimed input signal including events of interest within an arrayed signal pattern, as recited in claim 1. 23. In response, as described in the above maintained rejection, Vol'pov et al. teach receiving of the reflected signals from small distant objects of interest (i.e. an input signal from events of interest) wherein the readings of the Fourier spectrum include a two dimensional array of phases from the signal (page 1521, col. 1, applied to one or two dimensional arrays (page 1521, col. 1, line 20) of phases (i.e. arrayed signal pattern). The radiation reflected from an object is collected, the traveling interference patterns are generated and the reflected signals are recorded (page 1521, col. 1, ¶3), therefore Vol'pov et al. teach input signal, as in claim 1. Without a limiting

definition of "an arrayed signal pattern", the one or two dimensional array of phases from the signal (col. 1, lines 17-21) as taught by Vol'pov meets the recited limitation.

24. Applicants argue (Remarks, page 22, ¶2-4) that Pfeifer does not perform interferometric analysis and consequently does not receive any input signal. Applicants note that Pfeifer teaches a virtual interferometer performing simulated interferometric measurements.

25. In response, the limitation of "performing active interferometric analyis" does not exclude analysis done on a signal from a virtual interferometer. Absent a limiting definition in the specification, the limitation "interferometric analysis" broadly embodies analysis carried out by an interferometer or analysis of signals from an interferometer. The limitation does not exclude a virtual interferometer or analysis of data from a virtual interferometer.

26. Applicants argue (page 23, ¶2 and ¶4) that that Pfeifer does not describe obtaining temperature variations from the input signal and the claimed processor performs active interferometric analysis on a received signal via a computationally induced interference mechanism.

27. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., obtaining temperature variations form the input signal and a computationally induced interference mechanism) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

28. In the instant case, the embodiment argued by applicants is within the scope of the claims, however the instant claims are not limited to that particular embodiment and further do not exclude the experimental techniques as taught by the art of record.

29. Furthermore, Pfeifer et al. does meet teach a computationally induced interference mechanism because Pfeifer et al. teaches a virtual instrument called a Virtual Interferometer for the assessment and measurement of uncertainty of interferometers (i.e. active interferometric analysis via a computationally induced interference mechanism).

30. Applicants argue that the teachings of the references are not sufficient to render the claims prima facie obvious because Vol'pov's techniques for synthesizing a complex Fourier spectrum cannot simulate interferometric measurements and Pfeifer's virtual interferometer cannot synthesize complex Fourier spectra.

31. In response, Applicants have not provided evidence for their assertion and that the Virtual Interferometer of Pfeifer et al. can not perform interferometric analysis on the signals from events of interest with an arrayed signal pattern as taught by Vol'pov et al.

## *Conclusion*

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Skibinsky whose telephone number is (571) 272-4373. The examiner can normally be reached on 8 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lori A. Clow/
Primary Examiner, Art Unit 1631

Anna Skibinsky, Examiner